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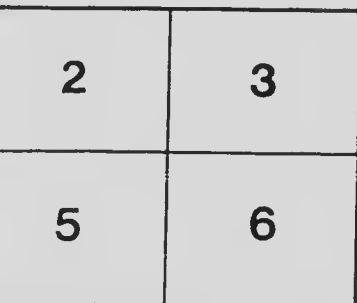
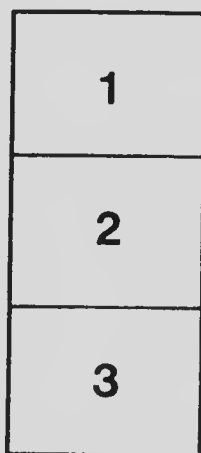
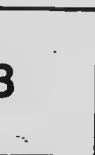
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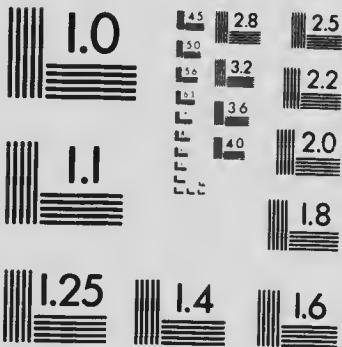
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FERTILIZER ECONOMY IN WAR TIME

COMMERCIAL FERTILIZERS

JUDICIOUSLY USED THEY MAY GREATLY INCREASE CROP PRODUCTION.

THEY ARE SUPPLEMENTS TO, NOT SUBSTITUTES FOR MANURE.

THEIR MOST PROFITABLE USE
WILL BE FOUND IN ASSOCIATION WITH THOROUGH CULTIVATION
ON SOILS
PLENTIFULLY PROVIDED WITH HUMUS.

THE INCREASE IN VALUE OF FARM PRODUCE IS
PROPORTIONATELY GREATER
THAN THE ADVANCE IN THE COST OF FERTILIZERS.

DOMINION EXPERIMENTAL FARMS.
SPECIAL CIRCULAR NO. 14.

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Fertilizer Economy in War-time

Economy—by no means **Parsimony**—should characterize our effort towards the attainment of greater crop production, the necessity for which was never more insistent than now.

A reasonable degree of caution is commendable, but lack of enterprise is reprehensible.

Efficient Economy involves the **Conservation of our Resources** and the **Concentration of our Forces**.

From the fertilizer standpoint, our resources are represented chiefly by the manures produced on the farm and the fertilizers of commerce, which may be employed to reinforce the manure and permit its more economic distribution.

The concentration of our forces may be interpreted as a judicious choice of rational means at our disposal and their opportune, systematic application to the particular matter in hand.

Economy in Fertilizing may sometimes imply a reduction in the per acre ratio which it has hitherto been customary to apply, for the fact is incontestable that many employ fertilizers greatly in excess of immediate crop requirements. Some are prompted to do so through the erroneous belief that crop yields may be increased in direct proportion to the quantities of fertilizers applied. But, on the other hand, fertilizer economy may mean increased rates of application, or a readjustment of the habitual proportions in which the various components have formerly been used.

The object to be attained is the **Maximum Crop Yield which will bring the maximum profit**.

INCREASE IN VALUE OF FARM PRODUCE GREATER THAN ADVANCE IN COST OF FERTILIZERS.

Except in the form of wood ashes, commercial potash has practically disappeared from our markets and, likewise as a result of war conditions, the prices of nitrogenous and phosphatic fertilizers have advanced tremendously. This fact might prompt the objection that the farmer cannot afford to use fertilizers as liberally as formerly, but we will endeavour to show that the increase in value of farm produce is proportionally greater than the advance in cost of fertilizers.

FERTILIZERS ARE SUPPLEMENTS TO, NOT SUBSTITUTES FOR MANURE.

Fertilizers are no panacea for all agricultural ills; they cannot be depended on to remedy the effects of inadequate drainage or poor tillage. They should be regarded primarily as supplements to manure, finding their most profitable employment, in association with thorough cultivation, on soils plentifully furnished with vegetable matter or humus.

ELEMENTS OF FERTILITY CONSIDERED IN FERTILIZING.

Of the twelve, or more, essential plant food substances in the soil, the available supply of three (nitrogen, phosphoric acid and potash) tends to become depleted by the growth and removal of crops. The maintenance of soil fertility demands their return in some form. Manure and fertilizers are the chief means employed in their restoration.

SOURCES OF NITROGEN, PHOSPHORIC ACID AND POTASH.

The principal nitrogenous fertilizers on the market are nitrate of soda, sulphate of ammonia, cyanamide, dried blood, tankage, fish scrap, etc.

Phosphoric acid is furnished by acid phosphate (superphosphate). basic slag, bone meal, bone tankage, etc.

Fortunately, perhaps, potash may be regarded as the least important—from the fertilizer standpoint—of the three essential plant food elements. Muriate and sulphate of potash were German products, the importation of which ceased on the outbreak of the war. Unleached wood ashes and seaweed are valuable sources of potash.

POTASH IN SOIL RENDERED AVAILABLE BY USE OF NITRATE OF SODA AND ACID PHOSPHATE.

It is a fact worthy of note that both nitrate of soda and acid phosphate may exert an appreciable, though indirect, influence in liberating potash from insoluble soil compounds—more especially in clay and clay loam soils.

PROFITABLE RETURNS FROM A COMBINATION OF NITRATE OF SODA AND ACID PHOSPHATE.

In the year 1915 an experiment was instituted at four Experimental Stations (Charlottetown, P.E.I., Kentville, N.S., Fredericton, N.B., and Cap Rouge, P.Q.) which included a plot that received (in 1915 only) 266 pounds of nitrate of soda and 570 pounds of acid phosphate per acre. No manure was given. The crop rotation consisted of potatoes, oats, hay, and the results for the first and second years are now available.

As compared with the average yield from the unfertilized check plots, the plot treated with nitrate of soda and acid phosphate produced, at each of the four Stations, a very substantial and profitable increase in both years. The average crop increases from the fertilized plot over the average yields from the unfertilized plots were as follows: 65.09 bushels of potatoes in 1915, 5.72 bushels of grain (oats) and 448 pounds of straw, per acre, in 1916.

PROFITS FROM FERTILIZERS IN PRE-WAR TIMES.

Assuming that in normal times potatoes were worth 50 cents per bushel, oats 50 cents per bushel and straw \$4.00 per ton, then the value of the increase for the two years would amount to \$36.30 per acre. Taking nitrate of soda at \$3.00 and acid phosphate (containing 16 per cent available phosphoric acid) at \$1.00 per 100 pounds, we find that 266 pounds of the former and 570 pounds of the latter would cost approximately \$13.70 which, deducted from the value of the increase, leaves a profit of \$22.60 per acre.

PROFITS FROM FERTILIZERS IN PRESENT TIMES.

At current market values, potatoes are worth at least \$1.00, and oats 75 cents per bushel, while nitrate of soda costs in the neighbourhood of \$6.00 and acid phosphate \$1.50 per 100 pounds. On this basis the crop increase has a value of \$70.28 per acre, and the fertilizer—costing \$24.50—leaves a profit of \$45.78, as compared with \$22.60 per acre, when the various commodities were valued at normal, pre-war prices.

FACTORS WHICH MAY INFLUENCE CROP YIELDS.

While the foregoing are actual results obtained by careful investigation, it does not follow that fertilizers, similar in kind and quantity to those

employed in the experiment cited, may invariably be depended on to bring equally favourable returns. Seasonable conditions—periods of drought, excessive rainfall, etc.—may and frequently do prove the limiting factor in production. But a readily available supply of plant food in the soil will enable a crop to recover more rapidly from or withstand adverse weather conditions.

SUGGESTIONS FOR FERTILIZING FARM CROPS.

Suggestions (modified by present circumstances) for the fertilizing of a few of the more important farm crops are made, as follows:—

	With Manure.	Without Manure.
	Lbs. per acre.	Lbs. per acre.
POTATOES, MANGELS, CORN—		
Nitrate of soda.....	100 to 150	150 to 250
Acid phosphate.....	250 to 350	350 to 500
TURNIPS—		
Nitrate of soda.....	75 to 125	100 to 150
Acid phosphate.....	400 to 600	600 to 800
GRAIN—		
Nitrate of soda.....		75 to 125
Acid phosphate.....		175 to 250
HAY—	(Chiefly	(Chiefly
Nitrate of soda.....	Timothy)	Clover)
Acid phosphate.....	100 to 150	50 to 75
	200 to 250	250 to 350

The foregoing recommendations are necessarily arbitrary, for in practice we rarely find two soils which exhibit exactly similar characteristics. The individual farmer must be his own experimenter in determining the peculiar deficiencies of his soil, but may, nevertheless, be guided by these suggestions.

The high solubility of nitrate of soda renders it generally advisable to apply one-half the prescribed quantity of this material with the phosphatic fertilizer during the final light cultivation of the land preparatory to seeding, the remainder—mixed with a quantity of soil to facilitate uniform distribution—being given as a topdressing shortly after the crop appears above ground.

CROPS FOR WHICH WOODASHES ARE PARTICULARLY SUITABLE.

Unleached wood ashes—already referred to as a source of potash—may contain from 4 to 6 per cent of potash, about 2 per cent of phosphoric acid and from 20 to 30 per cent of lime. For crops such as clover, beans, peas and other legumes, which respond particularly to applications of lime and potash, wood ashes should prove a most valuable soil amendment. On light soils especially their use is likely to be attended by very beneficial results.

To avoid delay and disappointment from freight traffic congestion and other causes, orders for fertilizers should be placed at the earliest possible opportunity.



